

Human-Robot Interaction

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21st January 2016

Intention Recognition

What does the human want to do?

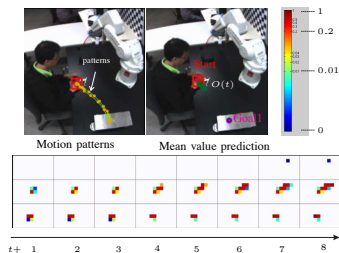


Figure: Predicting human movement from Hidden Markov Models: Ding et. Al, *Online Computation of Safety-Relevant Regions for Human Robot Interaction* 2012

We often want to know where a human is going or what it intends to do so that we can move around it, assist it in its task, or otherwise adapt the behaviour of the robot to be safer or more helpful to the human.

Intention Recognition

What does the human want to do?

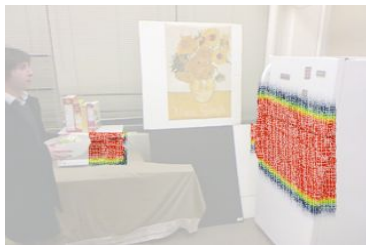


Figure: Heatmap of object affordances: Koppula & Saxena, *Anticipating Human Activities using Object Affordances for Reactive Robotic Response* 2013

- What is the human reaching for? - avoidance/assistance
- Where is the human going? - mobile robotics
- Is a collision intentional or unintentional? - industrial robots

Social robotics in HRI

Understanding and emulating human-human interactions and behaviour can make robots more intuitive, more versatile and safer. This topic may touch on aspects of artificial intelligence, linguistics and ethics.



Figure: Human engaging in turn-taking interaction with robot: Chao & Thomaz, *Turn Taking for Human-Robot Interaction* 2010

Social robotics in HRI

- What is the state-of-the-art in understanding and modelling social behaviour in human-human interactions? (theoretical side)
 - Modelling conversation
 - Body-language cues
 - Human expectations of robots
- How has it been / can it be applied in human-robot collaboration scenarios? (practical side)
 - HRI in industrial settings
 - Elderly care (Paro)
 - James the bartender
 - Alice/Eliza (chatbots)

Your task

The semester project can take one of three forms:

- A pure literature review
- Focussing on one paper and implementing it/parts of it
- A mixture of the above

Bear in mind: while a pure literature review looks easier, the latter two offer more opportunities for originality (and are probably more fun!)

Interested?

Or do you have another idea for a topic in Human-Robot Interaction?

Contact me!

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